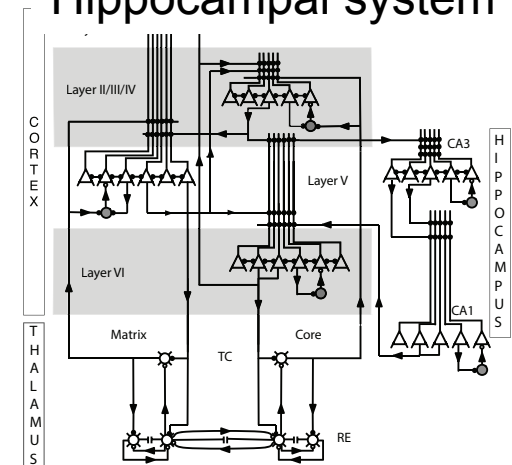


Sensory processing, plasticity and pattern recognition in a complex 'mini' brain

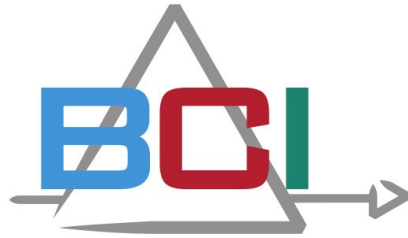
- Brian H Smith
Arizona State University
Behavioral neuroscience, sensory ecology, learning, memory
- Ramon Huerta
University of California San Diego
Dynamical systems, optimization, machine learning,
computational neuroscience
- Maxim Bazhenov
University of California Riverside
Computational neuroscience, modeling cortical networks,
neuronal oscillations, synchrony



Hippocampal system

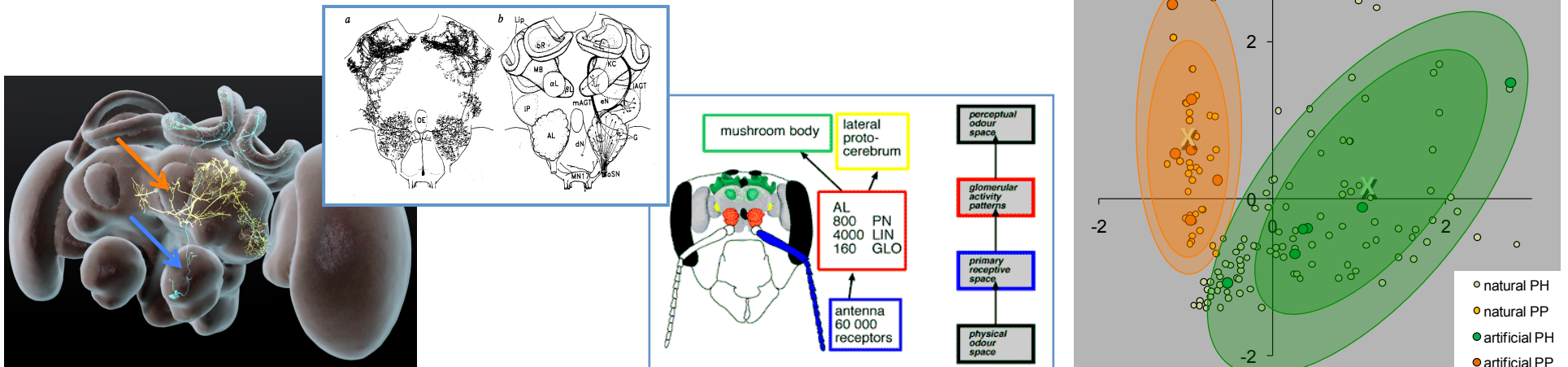


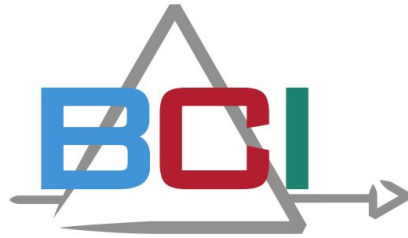
We are close to being able to model an entire insect 'mini' brain, which shows similarity to circuits in mammalian brains



RESEARCH AREAS OF INTEREST

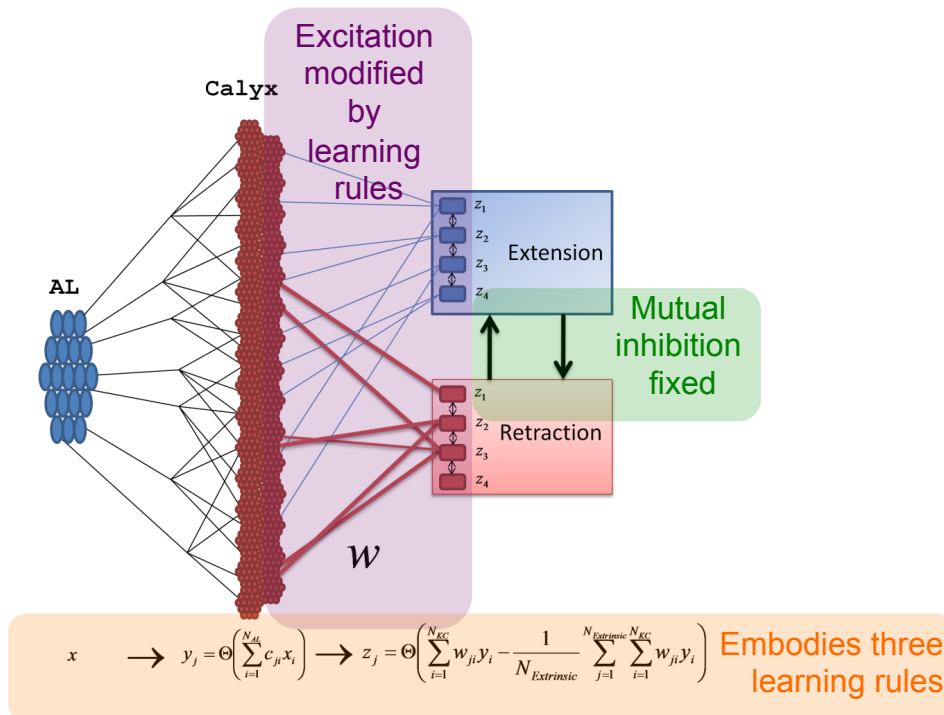
- Multimodal sensory integration for pattern recognition in the main centers of learning and memory in the insect brain.
- Integration of machine learning algorithms with the structural organization and the location of learning in the brain.
- Simultaneous massive parallel recordings of **early coding regions (antennal lobe)** and **deep brain structures (mushroom bodies)**.
- Integration of realistic conductance based models with experimental recordings of the brain during behavioral conditioning.



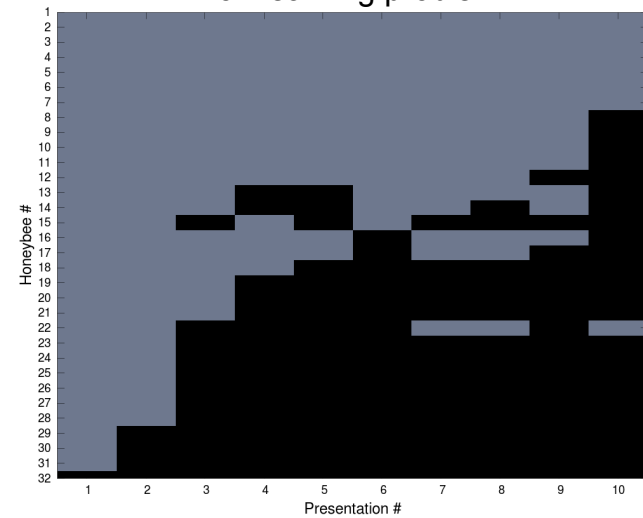


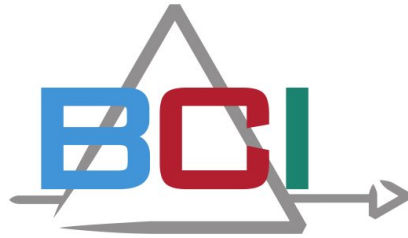
RESEARCH AREAS OF INTEREST

- The mechanisms of decision making and the similarities between humans and insects.
- The intrinsic structural robust intelligence of the insect brain to solve pattern recognition problems and decision making.



Individual performance of honey bees on learning problem



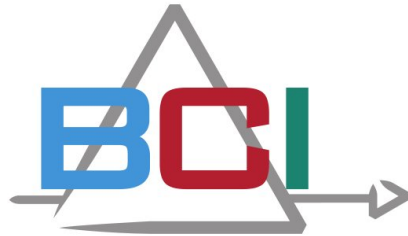


OUR QUALIFICATIONS AND ABILITIES

- We provide expertise on speech recognition, olfactory processing/ plasticity and decision making
- We have developed complex, realistic models of how the insect brain accomplishes these goals
- The models are adaptable to other sensory modalities and pattern recognition problem
- We are close to being able to model an entire insect 'mini' brain, which shows similarity to circuits in mammalian brains

CAPABILITIES WE ARE SEEKING

- Our group would greatly benefit by extension of our work to vision and image recognition



Contact Information

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